

Patent Claims:

1 – 9 (canceled)

10. (new) A method for determining the signal-to-noise ratio of arbitrarily polarized optical signals of different wavelength that are combined to form a wave division multiplex signal according to a polarization nulling method, comprising:

recording and storing power spectra of the wave division multiplex signal for a first defined setting  $m = 1$  ( $m = 1, 2, \dots M$ ) of a first polarization-optical phase controller and for  $N$  ( $n = 1, 2, \dots N$ ) settings of a second polarization-optical phase controller;

determining and storing a maximum deviation for the optical signals from the power spectra;

recording and storing the power spectra of the wave division multiplex signal for ( $M-1$ ) new settings of the first polarization-optical phase controller and for  $N$  settings in each case of the second polarization-optical phase controller;

determining and storing from the stored power spectra for each setting of the first phase controller the maximum deviations with  $m = 1, 2 \dots (M-1)$  of the signals; and

calculating the signal-to-noise ratio for the optical signals based on all of the deviations.

11. (new) The method according to Claim 10, wherein the deviation of an optical signal is determined by an interpolation.

12. (new) The method according to Claim 10, wherein the signal power of the optical signal is determined by an interpolation of the squared deviations.

13. (new) The method according to Claim 10, wherein a sum of the signal and noise power is determined by measuring the power at the input of a polarization controller and a noise power is determined by subtracting a determined signal power of the optical signal.

14. (new) The method according to Claim 10, wherein the number of polarization controller settings is selected on a minimum basis depending on a specified relationship between precision determination of the signal-to-noise ratio and measurement time.

15. (new) The method according to Claim 10, wherein phase shifts between the components of an electrical field vector of an optical signal and a polarizer are performed by phase retarder plates as polarization-optical phase controllers.

16. (new) The method according to Claim 10, wherein a first phase retarder plate can be set using a first rotation angle and a second phase retarder plate can be set using a second rotation angle.

17. (new) The method according to Claim 16, wherein the settings of the first and second phase retarder plates are implemented in such a way that a first phase shift is set for a first rotation angle and a plurality  $N$  of angles are set from which a set of  $N$  power values is recorded, from these power values a first sinusoidal interpolation curve is determined whose deviation is stored in a table, the settings of the angles are repeated for further rotation angles with  $m > 1$  for recording further power values from which further deviations are stored and whose values are squared and interpolated with a sinusoidal curve as a function, and the signal power of the optical signal is determined from the deviation of the sinusoidal curve by the signal-to-noise ratio (OSNR) is derived for the optical signals.

18. (new) The method according to Claim 10, wherein a resolution cell with a bandwidth equal to or less than the spectral width of a channel of a WDM signal is selected to record the power values of an optical signal.

19. (new) A device for determining the signal-to-noise ratio of arbitrarily polarized optical signals of different wavelength which are combined to form a WDM signal according to a polarization nulling method, comprising:

a memory unit added to an optical spectrum analyzer for tabulating the power values of the spectra measured at the optical spectrum analyzer for different settings of the phase controllers; and

a determination unit connected to the optical spectrum analyzer for calculating the signal-to-noise ratio by interpolation and deviation searching of the power values recorded at the optical spectrum analyzer,

wherein after passing through a first and a second polarization-optical phase controller the optical signal is injected into a linear polarizer with following optical spectrum analyzer.